

Factors Influencing a Communitywide Campaign to Administer Hepatitis A Vaccine to Men Who Have Sex With Men

ABSTRACT

Objectives. A hepatitis A outbreak among men who have sex with men (MSM) led to a publicly funded vaccination campaign. We evaluated the MSM community's response.

Methods. A cohort of MSM from 5 community sites was surveyed.

Results. Thirty-four (19%) of 178 potential vaccine candidates received the vaccine during the campaign. We found a linear relation between the number of exposures to campaign information and the likelihood of vaccination ($P < .001$). Vaccination was independently associated with awareness of the outbreak and the vaccine, having had sexual relations with men for 12 years or longer, having recently consulted a physician, and routinely reading a local gay newspaper.

Conclusions. The difficult task of vaccinating MSM can be aided by repetitive promotional messages, especially via the gay media. (*Am J Public Health.* 2000;90:1942–1946)

Michael S. Friedman, MD, Paul A. Blake, MD, MPH, Jane E. Koehler, DVM, MPH, Lori C. Hutwagner, MS, and Kathleen E. Toomey, MD, MPH

Because of the occurrence of outbreaks of hepatitis A among men who have sex with men (MSM), and because of prevalence and incidence studies that show an increased risk of hepatitis A among MSM, routine hepatitis A vaccination of MSM has been recommended.¹ However, use of the vaccine by this high-risk population has been limited, even in outbreak settings.

The Georgia Division of Public Health began a hepatitis A vaccine campaign focused on MSM in November 1996, 8 months after it identified a large ongoing hepatitis A outbreak among MSM in Atlanta. The first of 2 doses of hepatitis A vaccine was provided free by the state health department from November 1996 to November 1997. Vaccination sites during the first 9 months of the campaign included public health clinics, offices of participating community physicians with large gay practices, a shopping mall popular with the MSM community, and the annual gay pride festival. The vaccine campaign was promoted via targeted physicians, articles and advertisements in local gay newspapers, community organizations serving MSM, and local gay-oriented businesses.

Campaign records indicated that approximately 3000 MSM (9.5% of Atlanta's estimated MSM population²) received 1 dose of the free vaccine. This level of vaccine coverage did not have a significant and immediate effect on the outbreak; reported hepatitis A cases among young men did not decline until late fall 1997.³

The survey study reported here was conducted from June through August 1997, 7 to 9 months after the vaccine campaign began and 9 to 11 months after the first public announcement regarding the outbreak.

Methods

We intended to survey a cohort of MSM that represented Atlanta's entire MSM population. Because no single source of data on this population or single means of contacting this entire group of men existed, a random sampling technique could not be used, and to our knowledge it has not been used routinely in surveys of MSM populations.^{4–6}

To approximate the population in question, we created a cohort by means of convenient clusters, each representing different, although overlapping, segments of the MSM

population. The following 5 groups were systematically approached and asked to participate: (1) attendees of the annual gay pride festival; (2) members of a gay church attending a Sunday religious service; (3) clients at an anonymous HIV testing center; (4) participants of a community organization's social and educational programs; and (5) clients of an African American community organization focusing on HIV prevention, support, and counseling.

The survey tool was a self-administered, anonymous, written questionnaire containing 48 yes/no and multiple-choice questions. Using Epi Info (Centers for Disease Control and Prevention, Atlanta, Ga), we analyzed participants' responses. The relationships between various characteristics (demographics, behaviors, knowledge) and 2 outcomes, awareness of the public health vaccination campaign and vaccination during the campaign, were explored. To control for clustering within sites, generalized estimating equations using SAS 6.12 (SAS Institute Inc, Cary, NC) were used to generate univariate and multivariate analyses.⁷ On the basis of these models, univariate odds ratios and adjusted odds ratios were calculated.

Results

Approximately 255 self-identified MSM at 5 community sites were asked to participate, with 210 (82%) completing the survey. The median age of participants was 34 years, and they had a median of 13.5 years of sexual relations with men. Seventy-three percent were White, 19% African American, and 7% Hispanic. Twenty percent earned less than \$15 000

At the time of the study, Michael S. Friedman was with the Epidemiology and Prevention Branch, Georgia Division of Public Health, and with the Epidemiology Program Office, Centers for Disease Control and Prevention, Atlanta, Ga. Paul A. Blake and Jane E. Koehler are with the Epidemiology and Prevention Branch, Georgia Division of Public Health. Lori C. Hutwagner is with the Epidemiology Program Office, Centers for Disease Control and Prevention. Kathleen E. Toomey is the director of the Georgia Division of Public Health.

Requests for reprints should be sent to Michael S. Friedman, MD, Centers for Disease Control and Prevention, Air Pollution and Respiratory Health Branch, 1600 Clifton Rd, Mailstop E17, Atlanta, GA 30333 (e-mail: mff7@cdc.gov).

This brief was accepted April 6, 2000.

and 14% earned more than \$55 000. Ninety-nine percent had graduated from high school, 53% had completed college, and 19% had an advanced/professional degree.

Of these 210 MSM, 109 (52%) knew that the health department was conducting a hepatitis A vaccine campaign and 138 (66%) were aware of Atlanta's recent hepatitis A outbreak. Most of those aware of the outbreak (73 of 138; 53%) had learned of it from articles or advertisements in Atlanta's largest gay newspaper.

Twenty-seven of the 210 men reported that a doctor or nurse had told them in the past that they had or had had hepatitis A, and they therefore considered themselves to be immune. Of the remaining 183 ostensibly susceptible men, 5 (3%) had received hepatitis A vaccine through private sources before the campaign. Thus, 178 men (85% of the study population) were considered to be vaccine candidates when the campaign began.

Overall, 19% (34 of 178 susceptible men) received hepatitis A vaccine during the campaign. Most (23 of 34; 68%) decided to receive the vaccine because of fear of the disease and/or because they felt at risk for acquiring the virus. Only 1 person reported that community or peer pressure contributed to his decision to receive the vaccine.

The most common reasons for not receiving the vaccine included (1) never got around to it (26%), (2) did not believe they were at risk (26%), and (3) never heard there was a hepatitis A problem (23%). Only 10%

felt that inconvenient vaccine sites/times contributed to their not receiving the vaccine. Of the 144 nonimmune men who did not receive the vaccine, 77 (54%) reported seeing a non-emergency department physician during the previous year, representing a substantial number of missed opportunities to vaccinate.

Analysis of the promotional campaign's impact on vaccination rates indicated no change in vaccine coverage among those who reported 1 exposure to information about the campaign compared with no exposure. However, vaccine coverage rates increased linearly as the number of information exposures increased beyond 1 (P for trend < .0001; Figure 1).

Examination of the study population's newspaper reading habits indicated that 40% read 1 or both local gay newspapers every week, 28% read the *Atlanta Journal Constitution* daily, and 4% read the *New York Times* daily. Both campaign awareness and vaccination status were directly associated with frequency of reading either local gay newspaper but were not associated with frequency of reading the *Atlanta Journal Constitution* or the *New York Times* (Figure 2). Routine readers of the gay newspapers did not differ significantly from nonroutine readers in the percentage expressing a strong interest in health-related news stories (53% vs 45%) and the percentage knowing about general headline health news in Atlanta (60% vs 61%). Neither the degree of interest in health-related news nor knowledge of headline health news was associated with out-

break awareness, campaign awareness, or vaccine coverage.

Table 1 summarizes the survey findings, including results of the univariate analysis. On multivariate analysis, 4 factors were independently associated with vaccination during the campaign: awareness of the outbreak and of a vaccine for hepatitis A (adjusted odds ratio [OR]=11.8; 95% confidence interval [CI]=3.5, 39.2), having sexual relations with men for 12 years or more (adjusted OR=2.4; 95% CI=1.4, 4.4), having consulted a physician since July 1996 (adjusted OR=2.2; 95% CI=1.0, 5.0), and routinely reading a local gay newspaper (adjusted OR=1.7; 95% CI=1.1, 2.6). Age was highly correlated with years of sexual relations with men, and campaign awareness was highly correlated with outbreak awareness; thus, neither age nor campaign awareness could be entered into the model to determine independence.

Discussion

To our knowledge, the response of a MSM population to a community-based public health vaccination campaign has not been reported previously. Such information is relevant because MSM have low hepatitis A and hepatitis B vaccine coverage rates despite recommendations that they receive these vaccines.^{1,4,8-11} In this study, only 25% of MSM reported having received at least 1 dose of the 3-dose hepatitis B series. Additionally, only 3% of susceptible men had received hepatitis A vaccine before the campaign. Furthermore, only 19% of susceptible men received hepatitis A vaccine during the campaign, far below the 50% level believed to be needed to halt transmission in non-MSM communities with endemic or epidemic disease.¹²⁻¹⁴

This study was designed, in part, to provide guidance for future public health campaigns focusing on MSM and perhaps other populations. The steady increase in vaccination rates with multiple exposures to campaign information implies that repeated messages in a prolonged promotional campaign might maximally encourage persons to perform the desired behavior (in this case, undergoing vaccination). It is noteworthy that vaccine-seeking behaviors were not improved by a single exposure to campaign information compared with none. This challenges the assumption that providing persons with health information only once can be sufficient to stimulate changes in behavior, even when the desired behavior is simply obtaining a vaccine.¹⁵⁻¹⁸ This exposure-dependent response to campaign information is consistent with the general consumer marketing and communication literature, where such approaches to behavioral modification are part of consumer marketing strategies.¹⁹⁻²¹

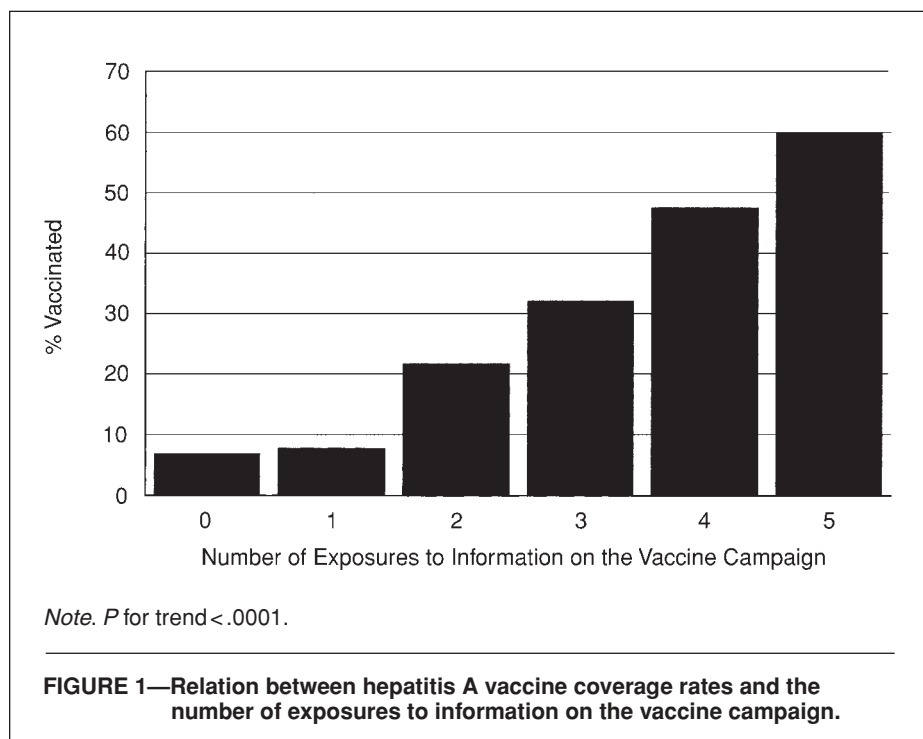


TABLE 1—Characteristics Associated With Campaign Awareness and Hepatitis A Vaccination During the Atlanta Vaccination Campaign

Characteristic	n (%)	Campaign Awareness		Vaccination During Campaign	
		% Aware	Univariate OR (95% CI)	% Vaccinated ^a	Univariate OR (95% CI)
Survey site ^b					
Gay pride festival	88 (42)	55	NA	20	NA
HIV testing site	33 (16)	42		3	
Church	35 (17)	49		24	
Community organization's functions	45 (21)	60		29	
African American community organization	9 (4)	33		12.5	
Race					
White	149 (73)	53	1.3 (0.8, 2.2)	23	3.3 (1.3, 8.1)
Non-White (Black, Hispanic, etc.)	56 (27)	48		8	
Age, y					
≤24	22 (11)	41	1.0	10	1.0
25–34	90 (44)	47	1.3 (0.7, 2.3)	15	1.7 (0.6, 4.9)
35–44	71 (35)	56	1.9 (1.3, 2.8)	24	3.1 (1.9, 4.9)
≥45	22 (11)	64	2.4 (1.0, 5.7)	31	4.4 (2.0, 9.6)
			(<i>P</i> for trend < .001)		(<i>P</i> for trend = .01)
Years of having had sexual relations with men					
0–9	51 (27)	55	1.0	11	1.0
10–19	78 (41)	46	0.7 (0.5, 1.1)	16	1.6 (0.9, 3.0)
≥20	61 (32)	52	0.9 (0.5, 1.5)	33	4.2 (2.8, 6.4)
			(<i>P</i> for trend = .78)		(<i>P</i> for trend < .0001)
Awareness of outbreak and a hepatitis A vaccine					
Yes	118 (56)	80	20.0 (10.8, 37.1)	32	12.7 (3.7, 43.7)
No	92 (44)	16		4	
Awareness of the vaccine campaign					
Yes	109 (52)	NA	NA	31	6.3 (2.3, 17.3)
No	101 (48)			7	
No. of exposures to campaign information					
0	101 (48)	NA	NA	7	1.0
1	16 (8)			8	1.3 (0.5, 2.9)
2	27 (13)			22	3.8 (0.9, 16.1)
3	34 (16)			32	6.5 (1.7, 24.5)
4	23 (11)			48	12.5 (5.1, 30.5)
5 or more	9 (4)			60	20.6 (2.2, 194.1)
					(<i>P</i> for trend < .0001)
Have consulted a non-ER physician since July 1996					
Yes	123 (59)	56	1.5 (1.0, 2.3)	25	2.5 (1.0, 6.2)
No	87 (41)	46		12	
Routine reader of a local gay newspaper					
Yes	83 (40)	66	2.7 (1.5, 4.9)	29	2.7 (1.5, 4.8)
No	127 (60)	43		13	
Knew someone who had hepatitis A in the past year					
Yes	36 (21)	78	3.9 (1.8, 8.2)	31	2.6 (0.9, 7.0)
No	137 (79)	47		15	
No. of sex partners in the past 2 months					
0	37 (18)	51	1.0	21	1.0
1	97 (48)	48	0.9 (0.6, 1.4)	17	0.8 (0.2, 2.9)
2–3	41 (20)	61	1.5 (0.6, 3.5)	17	0.8 (0.2, 3.0)
≥4	29 (14)	55	1.2 (0.6, 2.2)	28	1.5 (0.5, 4.8)
			(<i>P</i> for trend = .30)		(<i>P</i> for trend = .52)
No. of anonymous sex partners in past 2 months					
≥1	45 (22)	53	1.0 (0.6, 1.6)	21	1.1 (0.6, 10.0)
0	158 (78)	53		19	
Had an STD in the past 12 months					
Yes	27 (14)	56	1.2 (0.6, 2.7)	10	0.4 (0.2, 1.1)
No	169 (86)	51		20	
HIV serostatus					
Positive	46 (26)	48	0.7 (0.3, 1.5)	24	1.0 (0.3, 3.4)
Negative	133 (74)	56		22	
Received hepatitis B vaccine in the past (≥1 dose)					
Yes	46 (25)	61	1.4 (1.2, 1.7)	19	0.9 (0.6, 1.5)
No	140 (75)	52		20	

Note. OR=odds ratio; CI=confidence interval; NA=not applicable; ER=emergency room.

^aBased on survey respondents without a known history of hepatitis A or hepatitis A vaccination before onset of the campaign.

^bSites considered as individual clusters in our general estimating equation model.

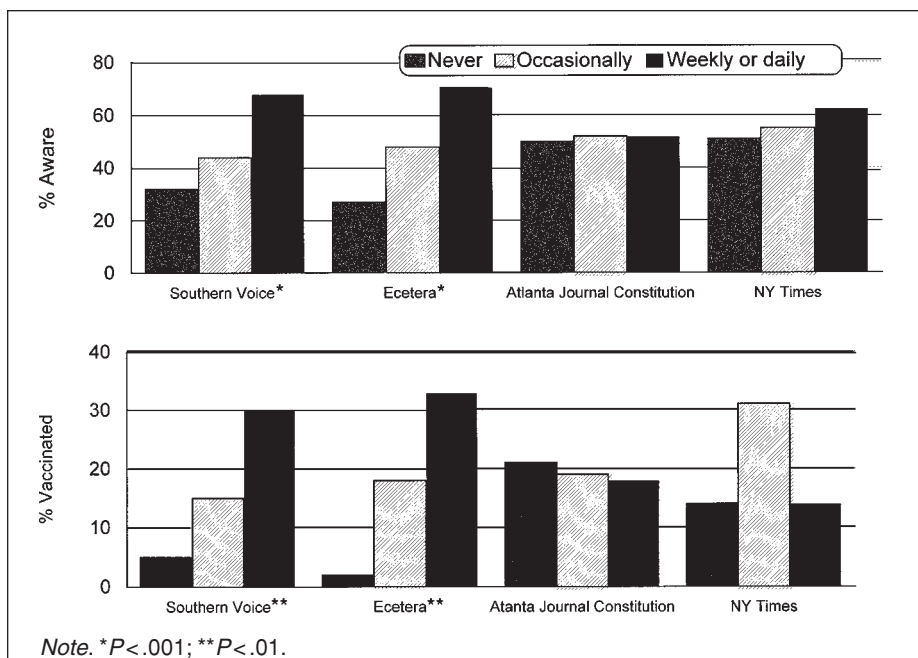


FIGURE 2—Impact of frequency of reading various newspapers on campaign awareness and vaccination rates.

Two results suggest that the local gay media is an excellent means of distributing health-related information to MSM populations. First, most of those aware of the outbreak learned of it through the local gay newspapers, although fewer than 10 articles and ads appeared in these newspapers over the campaign's first 9 months. Second, routinely reading either local gay newspaper was significantly associated with vaccination, even after outbreak and vaccine awareness were controlled for. These newspapers may have provided their readers with a trusted community source for campaign and outbreak information that led these men to consider the outbreak and vaccination opportunities more seriously.

This study provided an opportunity to pose an additional question: within a given high-risk population, do public health campaigns such as this one attract those persons at highest risk (those meant to be targeted) or persons who are already at lower risk because of greater concern about health? We found that those at highest risk for acquiring hepatitis A sexually were neither more nor less likely to have been vaccinated during the campaign. Therefore, this campaign may have failed to selectively motivate the persons at highest risk, possibly by failing to inform individual men of their risk for acquiring hepatitis A relative to others in their community.

There is no practical way to know how well our respondents represented Atlanta's MSM population. The groups sampled may overrepresent openly gay persons, who may be

more likely to learn of and get involved in MSM community events, such as this vaccine campaign.

Although Atlanta physicians serving mainly MSM were informed of the outbreak and the need for vaccination and were provided free vaccine, the vaccine campaign focused on community functions and sites. The rationale was that those MSM at highest risk infrequently use preventive medical services. However, our survey found that men who consulted a physician during the previous year were not at lower risk for hepatitis; they had roughly the same mean number of sex partners and anonymous partners and more sexually transmitted diseases than those who did not consult a physician. Unfortunately, most of these physician encounters represented missed opportunities to vaccinate. If half of the 77 susceptible yet unvaccinated men who consulted a physician during the outbreak had received the vaccine from their physician, vaccine coverage rates would have increased 113%, from 19% to 41%. Why missed opportunities occur merits further investigation in future campaigns.

Despite a well-coordinated outreach campaign, vaccination coverage failed to reach levels needed to control such outbreaks. By decreasing missed opportunities by physicians to vaccinate and intensifying promotional messages, especially through the local gay media, higher vaccination rates should be achieved in future campaigns. Alternatively, hepatitis A vaccination could be promoted among the general population during the school-age or toddler

years, as is the case with the hepatitis B vaccine. The difficult and time-consuming effort of vaccinating high-risk populations would thereby become obsolete over time. □

Contributors

M. S. Friedman planned the study, designed and field-tested the questionnaire, arranged for survey administration at the 5 sites, analyzed the data, and wrote the paper. P. A. Blake, J. E. Koehler, and K. E. Toomey assisted with the study design, questionnaire development, and writing of the paper. L. C. Hutwagner performed all of the univariate and multivariate analyses with generalized estimating equations and helped write the Methods section. K. E. Toomey supervised the vaccination campaign and helped generate interest in the MSM community for this vaccine evaluation study.

Acknowledgments

The Georgia Division of Public Health would like to specifically thank AID Atlanta, Outreach, Inc, the Fulton County Department of Health and Wellness, and the DeKalb County Board of Health for their active roles in the hepatitis A vaccine campaign and administration of the surveys.

The study was approved by the institutional review board of the Georgia Department of Human Resources.

References

- Centers for Disease Control and Prevention. Prevention of hepatitis through active or passive immunization. *MMWR Morb Mortal Wkly Rep.* 1996;45:21–24.
- Holmberg SD. The estimated prevalence and incidence of HIV in 96 large US metropolitan areas. *Am J Public Health.* 1996;86:642–654.
- Centers for Disease Control and Prevention. Hepatitis A vaccination of men who have sex with men—Atlanta, Georgia, 1996–1997. *MMWR Morb Mortal Wkly Rep.* 1998;47:708–711.
- McCusker J, Hill EM, Mayer KH. Awareness and use of hepatitis B vaccine among homosexual male clients of a Boston community health center. *Public Health Rep.* 1990;105:59–64.
- Van de Ven P, Prestage G, French J, Knox S, Kippax S. Increase in unprotected anal intercourse with casual partners among Sydney gay men in 1996–98. *Aust N Z J Public Health.* 1998;22:814–818.
- Nardone A, Dodds JP, Mercey DE, Johnson AM. Active surveillance of sexual behaviors among homosexual men in London. *Commun Dis Public Health.* 1998;1:197–201.
- Zeger SL, Liang KY. Longitudinal data analysis for discrete and continuous outcomes. *Biometrics.* 1996;42:121–130.
- Centers for Disease Control and Prevention. Undervaccination for hepatitis B among young men who have sex with men—San Francisco and Berkeley, California, 1992–1993. *MMWR Morb Mortal Wkly Rep.* 1996;45:215–217.
- Neighbors K, Oraka C, Shih L, Lurie P. Awareness and utilization of the hepatitis B vaccine among young men in the Ann Arbor area who have sex with men. *J Am Coll Health.* 1999;47:173–178.
- Alter MJ, Hadler SC, Margolis HS, et al. The

- changing epidemiology of hepatitis B in the United States. *JAMA*. 1990;263:1218–1222.
11. Grob PJ, Rickenbach M, Wagner S, Steffen R, Gutzwiller F. Hepatitis B vaccination of high-risk individuals in the canton of Zurich. *Eur J Clin Microbiol*. 1983;2:309–315.
12. McMahon BJ, Beller M, Williams J, Scholoss M, Tantiila H, Bulkow L. A program to control an outbreak of hepatitis A in Alaska by using an inactivated hepatitis A vaccine. *Arch Pediatr Adolesc Med*. 1996;150:733–739.
13. Craig AS, Moore W, Schnaffner W, et al. Use of hepatitis A vaccine to control a communitywide outbreak. *Clin Infect Dis*. 1998;27:531–535.
14. Prikazsky V, Olear V, Cernoch A, Safary A, Andre F. Interruption of an outbreak of hepatitis A in two villages by vaccination. *J Med Virol*. 1994;44:457–459.
15. Balas EA, Jaffrey F, Kuperman GJ, et al. Electronic communication with patients: evaluation of distance medicine technology. *JAMA*. 1997;278:152–159.
16. Lewis B, Lynch W. The effect of physician advice on exercise behavior. *Prev Med*. 1993;22:110–121.
17. Calfas KJ, Long BJ, Sallis JF, et al. A controlled trial of physician counseling to promote the adoption of physical activity. *Prev Med*. 1996;25:225–233.
18. Logsdon DN, Lazaro CM, Meier RV. The feasibility of behavioral risk reduction in primary medical care. *Am J Prev Med*. 1989;5:249–256.
19. Shrum LJ, O'Guinn TC. Processes and effects in the construction of social reality: construct accessibility as an explanatory variable. *Commun Res*. 1993;20:436–471.
20. Gerbner G, Gross L, Morgan M, Signorielli N. Charting the mainstream: television's contributions to political orientations. *J Commun*. 1982;32:100–127.
21. Price V, Czilli EJ. Modeling patterns of news recognition and recall. *J Commun*. 1996;46:55–78.